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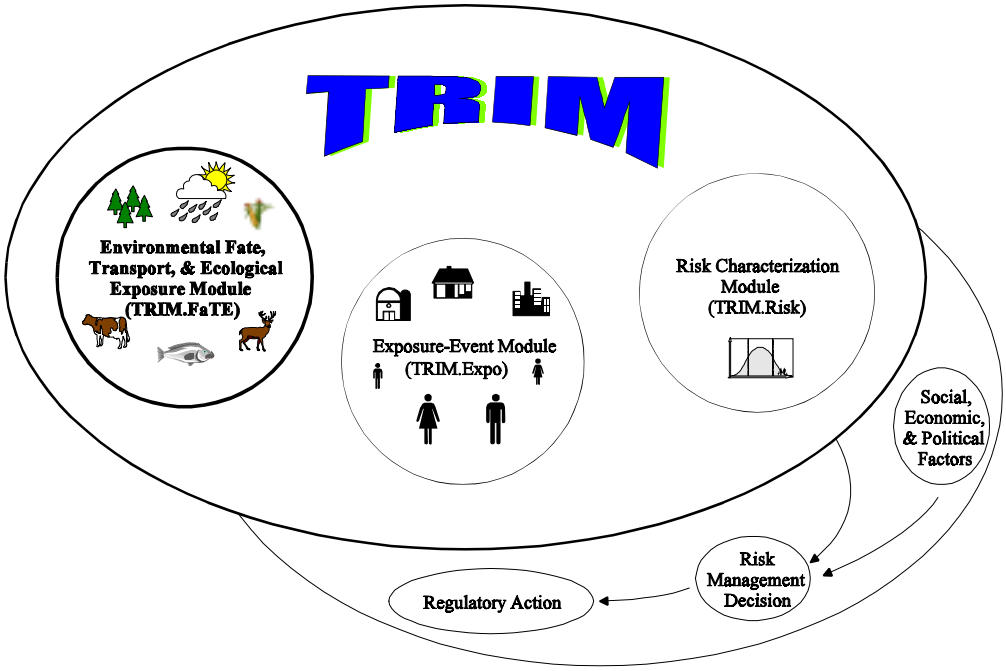
Air

TRIM
Total Risk Integrated Methodology

TRIM.FaTE
TECHNICAL SUPPORT DOCUMENT
Volume I: Description of Module

EXTERNAL REVIEW DRAFT



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U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

External Review Draft
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As described in this report, the Office of Air Quality Planning and Standards (OAQPS) of the U.S. Environmental Protection Agency is developing the Total Risk Integrated Methodology. The principal individuals and organizations in the TRIM.FaTE development effort and in the preparation of this report are listed below. Additionally, valuable technical support for report development was provided by ICF Consulting.

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PREFACE

This draft document, the *TRIM.FaTE Technical Support Document*, is part of a series of documentation for the overall Total Risk Integrated Methodology (TRIM) modeling system. The detailed documentation of TRIM's logic, assumptions, algorithms, equations, and input parameters is provided in comprehensive Technical Support Documents (TSDs) for each of the TRIM modules. The purpose of the TSDs is to provide full documentation of how TRIM works and of the rationale for key development decisions that were made. This report, which supersedes an earlier version (U.S. EPA 1998a), documents the Environmental Fate, Transport, and Ecological Exposure module of TRIM (TRIM.FaTE) and is divided into two volumes. The first volume provides a description of terminology, model framework, and functionality of TRIM.FaTE, and the second volume presents a detailed description of the algorithms used in the module.

To date, EPA has issued draft TSDs for TRIM.FaTE (this report) and the Exposure-Event module (*TRIM.Expo TSD*, U.S. EPA 1999a). When the Risk Characterization module (TRIM.Risk) is developed, EPA plans to issue a TSD for it. The TSDs will be updated as needed to reflect future changes to the TRIM modules.

The EPA has also issued the 1999 *Total Risk Integrated Methodology (TRIM) Status Report* (U.S. EPA 1999b). The purpose of that report is to provide a summary of the status of TRIM and all of its major components, with particular focus on the progress in TRIM development since the 1998 *TRIM Status Report* (U.S. EPA 1998b). The EPA plans to issue status reports on an annual basis while TRIM is under development.

In addition to status reports and TSDs, EPA intends to develop detailed user guidance for the TRIM computer system. The purpose of such guidance will be to define appropriate (and inappropriate) uses of TRIM and to assist users in applying TRIM to assess exposures and risks in a variety of air quality situations.

Comments and suggestions are welcomed. The OAQPS TRIM team members, with their individual roles and addresses, are provided below.

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ACRONYMS

B(a)P	Benzo(a)pyrene
CAA	Clean Air Act
CalTOX	California Department of Toxic Substance Control's Risk Computerized Model
CART	Classification and regression tree
CDF	Cumulative distribution function
CRARM	Presidential/Congressional Commission on Risk Assessment and Risk Management
DOE	United States Department of Energy
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
HAP	Hazardous air pollutant
IEM	Indirect Exposure Methodology
I/O API	Environmental Decision Support System/Models 3 Input/Output Applications Programming Interface
ISMCM	Integrated Spatial Multimedia Compartment Model
LHS	Latin Hypercube Sampling
LSODE	Livermore Solver for Ordinary Differential Equations
MC	Monte Carlo
MCM	Multimedia Compartment Model
MEPAS	Multimedia Environmental Pollutant Assessment System
MPE	Multiple Pathways of Exposure
NAAQS	National ambient air quality standard
NAS	National Academy of Sciences
NATA	National Air Toxics Assessment
OAQPS	EPA Office of Air Quality Planning and Standards
OSWER	EPA Office of Solid Waste and Emergency Response
PAH	Polycyclic aromatic hydrocarbon
PDF	Probability distribution function
RIA	Regulatory impact analysis
SAB	Science Advisory Board
SMCM	Spatial Multimedia Compartment Model
TRIM	Total Risk Integrated Methodology
TRIM.Expo	TRIM Exposure-Event module
TRIM.FaTE	TRIM Environmental Fate, Transport, and Ecological Exposure module
TRIM.Risk	TRIM Risk Characterization module
TSD	Technical Support Document
WASP	Water Quality Analysis Simulation Program

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Appendices